**Lab Report Instructions and Guided Handout**

 The steps below will guide you to create your lab report. The final lab report will count as a test grade. Make sure to complete each step of the lab report and turn into your teacher. You will be prepared to type up and turn in the final formal lab report on this date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Step 1: Purpose: Ask a scientific question about plant growth. Pick one!**

* What are you interested in learning about and experimenting?
* Examples: How does sunlight affect plant growth? How does soda affect plant growth?
* Guiding questions: How does \_\_\_\_\_\_\_\_\_\_ affect plant growth? How is \_\_\_\_\_different from \_\_\_\_\_\_\_?

**Step 2: Understanding variables in your experiment**

* Variable: any factor in an experiment that can affect what happens in the experiment. Variables that can affect the growth of plants include: amount of light, amount of water, temperature, type of water (liquid), soil or fertilizers, type of pots, & MORE
* A well-designed experiment only changes ONE variable at a time. Pick ONE variable that you want to change and test in your experiment. Write it here:
* **Independent variable:** factor that the scientist intentionally changes during the experiment to find the effect it has on something else. **Dependent variable:** the factor that is measured or observed in the experiment. **Controls or constants**: factor in the experiment that MUST be kept the same to make sure it does not change the experimental results.
* Fill in below: In your experiment, what is the
	+ Independent variable?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ Dependent variable?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ Controls or constants?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Step 3: Writing a Hypothesis**

*A hypothesis is an educated guess or statement a scientist makes about the outcome of the experiment.* This statement should be based on background knowledge and should include reasons why you think the outcome will happen. **Use a “IF…then…” statement to write your hypothesis.** For example: If a plant receives more sunlight, then it will grow taller because sunlight is needed for photosynthesis. Use your independent and dependent variables in your hypothesis. Write your hypothesis below:

Include the following research about plants and their growth: (Staple any research you gathered and include the URL of websites, need at least 2)

1. What factors affect plant growth? Why?
2. How will \_\_\_\_\_\_\_ variable affect plant growth?
3. What are pea plants? What is photosynthesis? How do plants respire?
4. Any other important information about pea plants or plants in general

**Step 4: Materials List**

List the materials you will use and need for your experiment. Your materials list must be very detailed and complete, include everything! **In your lab report, you may list these in bullets.** *Make sure to include how much of each material you used.*

Example:

* 1 cup of potting soil
* 2 ziplock bags (quart size)
* 2 pea plant seeds

**Step 5: Writing the Procedure**

The procedure section of your lab report will include the steps of HOW you did your experiment. This is a very **clear, step-by-step list** of things you plan on doing during the experiment. Each step should be short and start with a verb. **Another scientist should be able to follow your procedure and get the same results as you!** For example: Fill two ziplock bags with 1 cup of potting soil each. **Place** one pea plant seed in each ziplock bag. **Add** 1 cup of soda (coke cola brand) to one bag and **add** 1 cup of water to the other bag. **Seal** the bags and place in window to receive sunlight. **Measure** daily the height of the pea plant. **Record** your findings.

*\*Tip\* You can write the procedure like a cooking recipe and list each step in bullets.*

**Step 6: Writing down Results**

Keep any measurements in a data chart. Record any observations about your plants (what you see, feel, etc.). You will need to create a chart and put into your lab report.

**Sample Chart: DO NOT JUST FILL IN BELOW**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Plant 1 Height (exposed to sunlight in window)(centimeters) | Plant 2 Height (in darkness) (centimeters) | Observations |
| Day 1 | 2 cm | 0 cm | Seed was not opened yet for plant 2. The seed for plant 1 was split and sprouting. The small sprouting was green. |
| Day 2 |  |  |  |
| Day 3 |  |  |  |
| Day 4…etc. |  |  |  |

**Step 7: Conclusion**

Analyze your data in your chart and determine if you data supports your hypothesis. For the hypothesis, “If a plant receives more sunlight, then the plant will grow taller” you would expect to see plant 1 (exposed to sunlight) grow taller than the control, plant 2 (in darkness).

Make sure to state in your conclusion:

* Did you data support your hypothesis or not? Explain why using the results you gathered during the experiment.
* What error could be involved with the experiment?
* What could you do to improve the experiment?

**Step 8: Include a title, name, date, and class period on lab report**

Make sure your title is detailed and includes your independent and dependent variables. A bad title would be “my plant experiment” because there are no details. A good title would be “the effects of sunlight on pea plant growth” because details and variables are stated clearly.

**Lab Report Structure:** Follow the order below when you type your final lab report.

1. **Title, name, date, class period**
2. **Purpose (include your research, variables, and hypothesis in this section)**
3. **Materials (include list of materials, see above for instructions)**
4. **Procedure (include list of procedures, see above for instructions)**
5. **Results & Data (include any raw data gathered in your experiment, put into a chart)**
6. **Conclusion (see above instructions)**

Each of the sections above will be clearly listed and bolded in your final lab report. I should see all of the sections above in your report.

**Final lab report must be typed, 12 point font, 1” margins, 3 pages**

**Computer lab date: We will have one class period on this date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**You and your partner will make a PowerPoint to tell about your experiment. No more than 5 slides. You will have another class period to work in the computer lab.**

**Computer Lab Date for PowerPoint:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**